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ENVIRONMENTAL SECURITY: WHAT IS DOD'S ROLE?

Kent Hughes Butts

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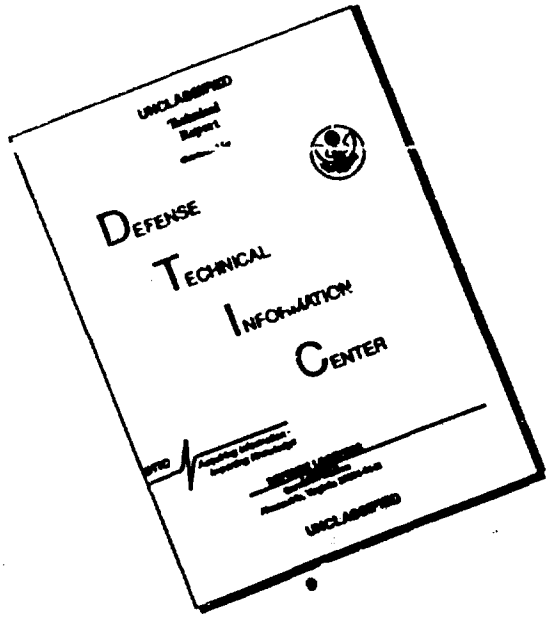

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Environmental security is an increasingly important dimension of the U.S. national security agenda as evidenced by the designation of a Deputy Under Secretary position by Secretary Aspin. In this study, the author addresses the major environmental initiatives that the Department of Defense has undertaken and recommends ways in which DOD can be even more effective in this area without degrading combat readiness.

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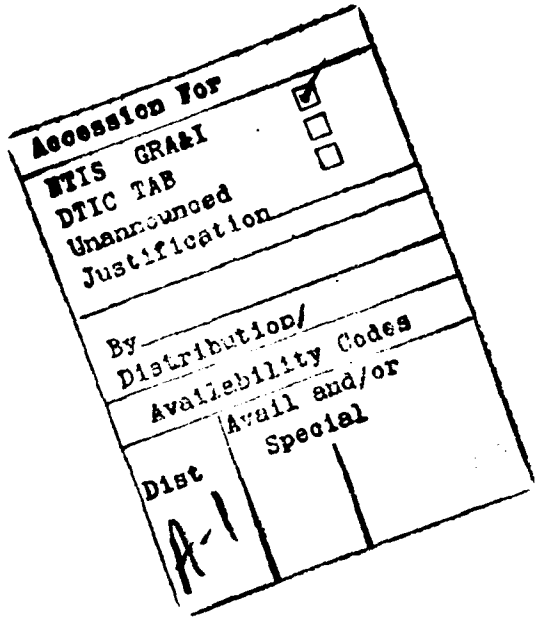
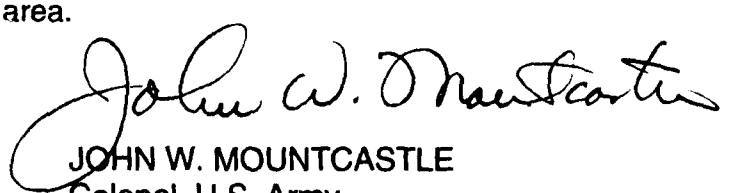


FOREWORD

The definition of national security in the post-cold war era continues to evolve and now includes the environment. In a floor speech, Senate Armed Services Committee Chairman Sam Nunn stated that the destruction of the environment was a threat to our national security and that "The defense establishment has a clear stake in countering this growing threat." This was followed by Secretary of Defense Aspin's reorganization of the Department of Defense (DOD) hierarchy to establish the position of Deputy Under Secretary of Defense for Environmental Security. These events make it clear that DOD will play an important role in the environmental security equation.

The assumption of an environmental security role by DOD is controversial. Opponents argue that a major role in this area would dilute combat readiness and that because of its history of environmental damage the military should not be engaged. These critics may fail to realize that DOD is already significantly and successfully involved in environmental security work and spends approximately $3 billion annually on environmental issues. Environmental security is important to DOD because it has the potential to affect base size, training and operations missions, and DOD budgetary priorities.

The author believes that DOD can substantially contribute to environmental security without undercutting combat readiness, and that executing its environmental stewardship mission in a positive and well-understood fashion can enhance its ability to achieve other organizational objectives. However, he cautions policymakers against committing DOD to extensive environmental activities that would adversely affect its long-term combat readiness. By analyzing and understanding DOD's contributions to environmental security, policymakers will have a better appreciation for the strengths and limitations of DOD's role in this important area.



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LIEUTENANT COLONEL KENT HUGHES BUTTS is a Strategic Research Analyst with the Strategic Studies Institute (SSI), U.S. Army War College, and is the War College Environmental Course instructor. A 1973 graduate of the U.S. Military Academy at West Point, he holds a Master's in Business Administration from Boston University, an M.A. and Ph.D. in Geography from the University of Washington, and was a John M. Olin Post Doctoral Fellow in National Security at the Center for International Affairs, Harvard University. His Army assignments include company command in the 1st Armored Division; serving as the Defense and Army Attache to Uganda and Malawi; and Associate Professor in the Science Research Laboratory at the U.S. Military Academy. While on the faculty at West Point, he was the Course Director for the Environmental Issues and Conservation of Natural Resources Courses in what is currently the Department of Geography and Environmental Engineering. LTC Butts the author of the SSI environmental studies: *Army Strategy for Environmental Success* and *The Army and the Environment: National Security Implications*, and co-author of the book, *Geopolitics of Southern Africa: South Africa as Regional Superpower*, published by Westview Press.

SUMMARY

When newly-appointed Secretary of Defense Les Aspin reorganized his principal staff, he created the position of Deputy Under Secretary of Defense for Environmental Security. The creation of this position draws attention to an issue that has a powerful following in Congress and the current administration—the use of the military for environmental security missions. This study examines important environmental roles and missions currently being executed by the Department of Defense (DOD), provides an assessment of their contributions to national security, and makes recommendations concerning DOD's future environmental peacetime role.

The Environmental Security.

With the end of the cold war, national security analysts began a reexamination of the definition of national security. As a result of this analysis, the definition of a national security interest was broadened to include the environment, and in 1991 the environment was included in the *National Security Strategy of the United States* (NSS) for the first time. In that document, the President pointed out that the failure to manage the earth's natural resources in ways that protect the potential for growth produces stress that is already contributing to political conflict. The 1993 NSS again addressed the importance of the environment and linked it decisively to the economic element of power.

The inclusion of the environment in the NSS demonstrates popular national and international awareness of the environmental dimensions of conflict, growth and development, health, and political stability. Environmental issues such as clean air, desertification, and natural resource access have a cross-border component that has contributed to international conflict. In his June 28, 1990 Senate floor speech, Senator Sam Nunn stated the concept more clearly,

> There is also a new and different threat to our national security emerging—the destruction of our environment. The defense establishment has a clear stake in countering this growing threat. . . one of our key national security objectives must be to reverse the accelerating pace of environmental destruction.

By expanding the definition of national security to include the environment, the NSS suggests that organizations with traditional national security roles, such as DOD, should expand their supporting strategies to include environmental objectives.

DOD's Environmental Roles.

The Clinton administration moved quickly to reinforce the concept of environmental security and the important role DOD would play in executing the national security strategy by creating the position of the Under Secretary for Environmental Security, and appointing Sherri Wasserman Goodman to fill it. In her May 13, 1993 statement before Congress, Ms. Wasserman defined DOD's environmental security mission as, "ensuring responsible environmental performance in defense operations and assisting to deter or mitigate impacts of adverse environmental actions leading to international instability." Given the importance of national security and the Clinton administration's vision that DOD will play a major role, it is important to understand what DOD is doing in the environmental security arena, and what it could do to enhance environmental security without negatively affecting combat readiness.

The Environment: Hope for Security Assistance.

DOD is contributing to the resolution of environmental problems through the creative use of its Security Assistance Programs. In Africa for example, the U.S. Civic Action program has been specifically funded by Congress to provide biodiversity and conservation support to struggling countries. Under this program, the U.S. military has helped host government militaries improve their countries' fisheries management, flood control and irrigation, wildlife protection and wildlife management programs. Congress has

demonstrated that it is willing to fund such programs, but not traditional weapons-related, combat arms security assistance programs. DOD's participation in these environmental roles enables the United States to maintain the military-to-military contact essential for **base access** and **overflight agreements** and **communication** with politically important militaries and **military governments that would otherwise be lost**, and address problems that threaten regional political stability.

Environmental problems in the less developed countries (LDCs) can lead to conflict that could involve U.S. combat forces in costly overseas operations. **For many LDCs environmental issues are survival interests and therefore potential sources of regional conflict**. In the Middle East, for example, the lack of water in Iraq and Syria has the potential to destabilize the region because of Turkish water resource management policies, which threaten to cut off water to downstream neighbors. On the margins of the Sahara and in the Horn of Africa, overgrazing and drought have led to famine and large refugee populations that have crossed international borders to strain the economic and political infrastructure of other countries. As the case of Somalia makes clear, the use of U.S. military forces to solve humanitarian problems that have their roots in environmental issues is now an acceptable form of U.S. foreign policy. With the cost of the Somalia operation approaching $1 billion, **to be paid by DOD**, it makes good sense to try to solve environmental problems before they can lead to future Somalia-like U.S. involvement.

Domestic Engagement.

Domestically, DOD needs to pursue contributions to environmental security as a strategy to overcome its poor environmental reputation and build popular support among the increasingly influential environmental lobby. As the major automobile makers and countless major corporations whose activities impact the environment realize, associating an organization with the environment and initiating voluntary environmental improvement programs builds good will with Congress and the environmentally-sensitive American public that enhances their ability to achieve primary corporate

objectives. DOD has substantial resources with which to mitigate environmental problems. Policy options that exploit the military's unique capabilities in the environmental security area for the mutual good of DOD and the environment can build popular support.

Military Threat to Environmental Security.

The cold war left a legacy of environmental disaster that is only now being revealed. As the April 1993 uranium explosion at the Russian nuclear weapons complex near Tomsk makes clear, weapons-related environmental problems continue. The Soviet Union's development programs for weapons of mass destruction were conducted with little regard for human health and natural resources. The resulting environmental damage included possible immune system damage from exposure to radiation to residents living near the nuclear test site, the pollution of important fisheries from uranium fuel dumped into the sea, and the irradiation of large areas from improper nuclear operations and waste disposal. In the United States, the legacy of the cold war includes environmental damage from the production of nuclear and conventional weapons that is estimated by Congress to cost DOD and the Department of Energy approximately $400 billion to clean up. This damage led many environmental organizations and some members of Congress to conclude that DOD activities were themselves a threat to the environmental security of the United States.

DOD has much to overcome. By current estimates, for example, there are approximately 11,000 hazardous waste sites on 1,877 DOD installations. While some of these are minor, 10 percent of EPA Superfund sites are found on DOD installations, such as the Rocky Mountain Arsenal near Denver Colorado, where the clean up of nerve and chemical agent waste may cost $3 billion. When DOD was slow in admitting its environmental problems and acting forthrightly to solve them, Congress directed it to take more aggressive environmental action and, in the name of environmental security, diverted some $200 million of DOD funding to environment improvement.

DOD's Unique Capabilities.

DOD has made great strides in improving its environmental performance and reputation, to include reducing its hazardous waste pollution by over 50 percent and spending over $2 billion a year on environmental enhancement. As a result, the Administration and Congress had seen the advantage of using DOD resources and capabilities for improving the nation's environment and would like to see DOD do more.

One of the primary benefits of DOD being actively involved in environmental work is that it brings national level resources to bear on state and local environmental problems. DOD offers a breadth of experience and the ability to transfer solutions that have been found to apply to other parts of the United States and offer them as possible solutions to local environmental managers. No other organizations or associations of organizations have the regional presence, management expertise, or resources to execute these environmental missions with the same success as DOD.

The size and power of DOD make it a significant environmental security resource. DOD employs over 3 million people around the globe, has an annual budget of nearly $300 billion, manages 2 million acres of land overseas and has domestic landholdings of 25 million acres. In addition to the thousands of National Guard and reserve component properties, DOD has over 1,100 significant installations. These installations compose national park-like recreation areas, vast forests, and desert areas. To the degree that this land is brought into accord with the nation's complex environmental laws, a significant portion of the United States can be termed environmentally secure. The size of DOD's land holdings makes it one of the largest environmental managers in the United States. Much of DOD's potential contributions come from existing programs and can be realized with relatively small costs and **command emphasis**. Many examples exist.

Chesapeake Bay, the largest estuary in the United States, is threatened by pollution and the overpopulation of the Bay basin. DOD was the first agency to sign an agreement with the EPA to participate in restoring the Bay. DOD's presence

insures that some 350,000 acres of the Chesapeake Bay watershed and 65 major DOD installations will be sharing the common goals and standards of performance associated with the restoration program. DOD shields 189,000 acres of undeveloped watershed from habitat destruction and, in FY 1990, spent approximately $50 million on erosion control, natural resource management, pollution prevention. and waste reduction to improve water quality in the Bay.

Parallel Missions.

The importance of DOD's environmental management role has increased with the development of private land surrounding many installations and the loss of wildlife habitat. DOD lands are becoming defacto game preserves where often they are a region's only sizeable habitats for endangered species. While this greatly complicates training at these installations, enlightened leadership on the part of the service chiefs and installation commanders and the toughening of environmental laws by local, state and federal governments have combined to make environmental stewardship a parallel mission to operational readiness. Installation commanders must now conduct realistic combat simulated training while managing flourishing herds of game and ensuring the continuation of endangered species. While some major installations initially failed to approach the environmental issue with a "can do" attitude, others such as Camp Pendleton and Camp Le Jeune have accepted the challenge of maintaining both operational readiness and environmental stewardship with great success.

Camp Pendleton Marine Corps Base located between San Diego and Los Angeles is a habitat oasis amidst the chronic over-development of Southern California. On this installation, many endangered species such as the Least Bells Virio have flourished. Pendleton also has a sizeable deer population and serves as a major Southern Californian water fowl wintering area. While there is competition between training and natural resource preservation, training and operational readiness have been maintained.

At Camp Le Jeune, the positive attitude of the commander toward environmental stewardship and the elevation of the environmental manager to primary staff level enabled the installation to maintain 52 live fire ranges in countless rotations of Marine battalions, while meeting the tough environmental standards related to the endangered Red Cockaded Woodpecker. The environmental management effort there has been so successful that when the base sought to expand and incorporate an additional 40,000 acres of timberland, environmental groups supported the effort and the land acquisition went forward. This demonstrates how maintaining a sound environmental stewardship program facilitates the accomplishment of another major DOD objective—base expansion.

The Legacy Program.

The DOD program with the greatest potential to enhance natural resources is the Legacy Resource Management Program which resulted from 1991 congressional legislation that provided funding for DOD stewardship of natural and cultural resources. Legacy projects have gone forward in over 30 states, creating partnerships between DOD and native American tribal elders, the Nature Conservancy, and the Arizona Fish and Game Department, among others. These projects resulted in restored wetlands and protected endangered and threatened species. DOD installations contain more than 250 threatened and endangered species which must be managed under the intense scrutiny of local environmental groups. The legacy program is a windfall for DOD, which stands to realize an enhanced reputation among environmental groups for its conservation efforts and cooperative environmental stewardship by simply maintaining its land.

The Corps of Engineers.

The U.S. Army Corps of Engineers is a separate major command that performs services for DOD and other agencies on a reimbursable basis. Within this command is the 40,000 person civil works organization that is now heavily involved in

remediation of the nation's toxic and hazardous waste sites. Its technical, environmental labs have contributed greatly to environmental security in the United States and abroad. For example, the Corps Waterways Experimentation Station developed the highly-praised, comprehensive waterflow model of the Chesapeake Bay that enabled multiple federal, state, and municipal water resource agencies to systematically prioritize problems and manage the complex Chesapeake estuary. The Corps' management of waterways, rivers, dams, and recreation areas, as well as its environmental stewardship for 12 million acres of land, demonstrates to the American public DOD's dedication to its environmental security mission.

Toxic and Hazardous Waste.

Because of the threat to domestic environmental security and the cost, the clean up of toxic and hazardous waste on DOD lands is arguably the most important environmental program. The 1984 Defense Appropriations Act established the Defense Environmental Restoration Account (DERA) under which funds are made available to clean up DOD bases. The authority for the Secretary of Defense to execute this program is contained in the Superfund Amendments and Reauthorization Act of 1986, which requires that DOD execute the program under the supervision of the EPA. Since 1984, DOD funding for the DERA has increased from $150 million per year to an estimated $1.6 billion in FY 1993. DOD's DERA request to Congress for FY 1994 is $2.3 billion. This unheralded increase in a noncombat enhancing portion of the DOD budget may be just the beginning. Already projected to escalate to nearly $3 billion a year by 1998, restoration funding could triple when a proper audit of all DOD installations for toxic and hazardous waste is conducted and when the full implications of the recently passed Federally Facilities Compliance Act (FFCA) are realized.

Signed into law only in 1992, the FFCA allows state and local governments to fine DOD installations for noncompliance with toxic and hazardous waste legislation as they would any private organization. Until this legislation, DOD had been protected by an interpretation of sovereign immunity. Congress

and the states believed that DOD hid behind sovereign immunity to avoid meeting its environmental responsibilities and so removed this protection with the FFCA. Because the upward end of the cost to clean up DOD installations is unknown, and a recent congressional estimate put the figure at $400 billion, the cleanup of past environmental sins will easily be the greatest financial contribution to environmental security that DOD makes. **Unless DOD develops a strategy of keeping expenditures on toxic and hazardous waste in check, the costs of cleaning up the 17,600 potential hazardous waste sites on DOD facilities and the large numbers of sites yet to be discovered could be major areas of environmental security participation that could undermine DOD operational readiness.**

Key Judgments.

- DOD has the capacity to make significant contributions to the environmental security of the United States and support the objectives outlined in the *National Security Strategy* without compromising its combat readiness.

- Most environmental programs that contribute to domestic and environmental security and create a positive environmental image with the public are inexpensive and can be executed with little more than command support. Environmental objectives that require the involvement of the individual soldier, such as planting a million trees a year or increasing the size of wetlands on DOD property, are popular and can be easily achieved.

- DOD should use its environmental performance to accomplish other organizational objectives. DOD should therefore associate itself with its environmental good deeds, publicize them, and work in genuine cooperation with environmental organizations and agencies to achieve a reputation as the most efficient and dedicated national organization for environmental stewardship.

- Using the Security Assistance Program to support biodiversity, conservation, and environmental improvement in developing countries makes sense because it recognizes the

intent of Congress, which funds the Security Assistance Program, maintains military-to-military contacts in strategically important regions, promotes political stability, and allows DOD to take direct action to minimize the future likelihood of costly overseas operations like Somalia.

- The U.S. Army Corps of Engineers has substantial and well-respected environmental assets that can make a major contribution to domestic and international environmental security; its participation in the resolution of environmental problems should be encouraged. Because many of the Corps of Engineers' operations are paid for on a reimbursable basis by non-DOD sources, their participation is cost effective for DOD. Moreover, the Corps' overseas involvement maintains military-to-military contact with foreign powers, promotes the sale of U.S. environmental technology and improves the balance of payments deficit.

- DOD environmental funding should emphasize day-to-day compliance with environmental law, conservation, and pollution prevention over the cleanup of toxic and hazardous waste that resulted from past practices.

- Current DOD estimates of toxic and hazardous waste cleanup costs of $24 billion are artificially low and misleading. EPA and congressional estimates more accurately place the cost in the several hundred billion dollar range. Pretending that these costs will remain relatively low discourages developing a decisive strategy for minimizing unacceptably high expenditures on past environmental sins. **Establishing the precedent of funding all environmental cleanup will have a long-term negative impact upon operational readiness.** DOD should establish an acceptable percent of its budget that it is willing to dedicate to environmental cleanup and demand that Congress provide separate, non-DOD budget appropriations for any additional cleanup to be undertaken in a given year.

ENVIRONMENTAL SECURITY: WHAT IS DOD'S ROLE?

INTRODUCTION

The definition of military roles and missions, and even vital interests, is changing radically. Few would have predicted the commitment of 25,000 U.S. troops to Africa for humanitarian reasons; few believe this precedent-setting operation will be the last of its kind. Both Congress and the new Democratic administration now believe that the war machine built up to defeat communism has achieved its purpose and that it will be reduced to a level capable of handling regional conflict unless new roles are articulated that would provide the rationale for maintaining force structure. Nontraditional roles, such as the war on drugs, providing security in cities, and educational activities have been suggested for the U.S. military. Another often mentioned role, and one that has been given heightened importance with Secretary of Defense Aspin's reorganization of the Department of Defense (DOD), concerns environmental security. Some suggest the military could do much to improve the environment of the United States and thereby contribute to national security as it is being defined in the post-cold war era. While the diversion of U.S. forces to the war on drugs is at least tangentially related to the military mission, an environmental role for DOD is less obvious and has often met with resistance from senior defense community personnel.[1] However, DOD is already an agent of environmental security, having requested $5.2 billion from Congress to execute its environmental security mission in FY 1994.[2] This study examines important environmental roles and missions currently being executed by DOD, provides an assessment of their contribution to national security, and makes recommendations concerning DOD's future environmental peacetime role.

The 1991 *National Security Strategy of the United States* (NSS) was the first NSS to recognize the environment as a U.S. national security interest; the environmental dimension

has been expanded in the 1993 NSS.[3] Its inclusion reflects popular national and international opinion which realizes that environmental issues have a major impact on economics and health, and are increasingly seen as a threat to development and political stability. Environmental issues such as clean air, desertification, and natural resource access have a cross-border component that has contributed to international conflict. By expanding the definition of national security to include the environment, the NSS suggests that traditional national security strategies should expand their focus to include environmental objectives. The military is thus included.

Critics on both extremes of the debate argue that military involvement in environmental matters is inappropriate, either because the military mission often harms both humanity and the environment, or because the strength of the military would be diluted should its focus be broadened to "nontraditional" social issues such as the environment or the war on drugs. However, both arguments wrongly assume that these nontraditional missions and the traditional military missions are mutually exclusive. These arguments fail to examine the fact that the military already plays a significant environmental role, either because it is the law, or because it makes good sense as a logical strategic concept for achieving other military objectives.

The military and environmental issues have rarely been linked in a positive vein, in part because many of the more outspoken environmentalists are associated with peace organizations or are philosophically opposed to war. The environmental transgressions of the military are often portrayed as willful and representative of all military operations. These characterizations are unfortunate, often inaccurate and do a disservice to those who are seeking policy options for improving the environment. While DOD does have environmental problems, they are not unlike those of any other large organization or landholding agency, private, state or federal. Unlike most other organizations, however, DOD has substantial capacities with which to mitigate environmental problems. It is time to reflect upon the military's unique

capabilities, and develop policy options which exploit these capabilities for the mutual good of DOD and the environment.

THE MILITARY'S TOXIC LEGACY

Environmentalists are right to be skeptical about the concept of involving the military in efforts to improve the environment. When Saddam Hussein released millions of gallons of oil into the Persian Gulf he demonstrated the extreme environmental consequences of warfare, and further associated the military with environmental degradation. Saddam's highly publicized action is but one of many military-generated environmental problems.

The cold war left a legacy of environmental disaster that is only now being revealed. The Soviet Union's development programs for weapons of mass destruction were conducted with little regard for human health or natural resources. Residents of the Western Siberian town of Altay, located near the nuclear test site of Semipalatinsk, show evidence in some studies of damaged immune systems from long-term exposure to radiation.[4] Environmental damage from secret nuclear explosions in the Yakutia area of Vilyui forced resettlement of the population.[5] The Soviets frequently disposed of nuclear waste by dumping it at sea; Norway (for example), fears serious consequences for its fisheries from uranium-fuel-containing nuclear reactors dumped by the Soviets east of Novaya Zemlya in the Kara Sea.[6] More problematic, plutonium extraction waste was discharged directly into lakes and rivers, and nuclear submarines and ships were sunk at sea and continue to leak fuel.[7] While the Soviets' unprincipled behavior is egregious, the United States also has nuclear-weapons-related environmental problems. Fifty billion dollars has already been allocated to clean up nuclear waste at Hanford, Washington, and the Department of Energy, which is responsible for nuclear weapons production, may spend over $200 billion dollars to remediate its weapon production sites and waste.[8]

In the non-nuclear environmental area, DOD has many problems, some of which resulted from a disregard of

environmental law. The Carter administration directed DOD to comply with environmental legislation in 1978, but little was done to enforce the order.[9] State environmental enforcement agencies and environmental groups criticize DOD for placing the environment behind the priority of deterring the Soviet Union, because they believe it was possible to accomplish both. The Unitary Theory of the Executive prevented federal agencies such as the Environmental Protection Agency from suing DOD for environmental violations, and the legal construct of Sovereign Immunity spared military facilities punitive fines from state agencies. Without the incentive of penalties, DOD was slow to adopt a strict environmental ethic and inconsistent in obeying environmental laws.

Congress directed the Government Accounting Office (GAO) to investigate DOD environmental activities. GAO investigators found environmental neglect; Federal facilities were twice as likely as private industrial facilities to be in noncompliance with water pollution regulations.[10] GAO reports further criticized DOD for not identifying low-level waste and completing hazardous waste assessments, and for giving environmental compliance a low priority.[11] As a result, DOD has many environmental problems that will cost billions of dollars to correct. To be fair, many of DOD's problems were created in the years before the United States became environmentally aware and enacted comprehensive environmental laws. Nonetheless, the problems exist and reflect badly on the military.

DOD produces and maintains weapons and equipment. It is a major industrial operator and produces industrial waste, much of it toxic and hazardous. By current estimates there are approximately 11,000 hazardous waste sites on 1,877 DOD installations. Some of these are minor, but 10 percent of the Superfund sites (the National Priority List of major hazardous waste sites) are found on DOD installations.[12] The most famous of these is Rocky Mountain Arsenal, near Denver, Colorado, where cleaning up nerve and chemical agent waste may cost $3 billion.[13] Other sites are just being discovered. The little known Riverbank Ammunition plant in California, whose production peaked during the Vietnam War, has polluted the

ground water with chromium and cyanide that may take 20 years to clean up.[14] The extent of its pollution was a surprise. A similar problem exists at Robbins Air Force Base in Georgia, where the drinking water of 10,000 people was polluted by cyanide and other chemicals.[15] Estimates of DOD cleanup costs vary between $23 billion and $400 billion.[16]

DOD's response to criticism of its environmental practices was less than forthcoming. DOD hid behind its cold war mission, security, and the legal construct of Sovereign Immunity to avoid complying with environmental laws and paying civil penalties to state and local governments. This "bad actor" behavior allowed environmental damage to continue unchecked, and convinced Congress that DOD, and other federal facilities, would not comply unless the last vestiges of Sovereign Immunity for hazardous waste management were removed. Accordingly, Congress wrote the Federal Facilities Compliance Act (FFCA) of 1992. Signed into law by President Bush, the FFCA clarifies the language of the Resource Conservation and Recovery Act, and allows state and local governments to assess fines and penalties against DOD installations for environmental noncompliance.[17] DOD's recalcitrance cost it public support at a time when it was seeking base expansion, and earned for DOD the image of being a threat to the nation's environmental security.

The publicity surrounding the cleanup of its toxic waste sites has caused DOD to reexamine its environmental commitment and programs, and generated positive benefits. DOD discovered that it is cheaper to **prevent pollution** than to clean it up and has reduced its hazardous waste pollution by nearly 50 percent. Further, it is investing hundreds of millions of dollars into the development of new cleanup technologies that will benefit private and international toxic and hazardous waste cleanup efforts. DOD is also investing $1.3 billion per year to comply with existing environmental rules, and has requested $2.5 billion for FY 1994.[18] DOD is becoming an instrument with which the U.S. Government can improve environmental security, and both the government and DOD now realize that the environment is a national security issue, and therefore a DOD responsibility.

IN THE NAME OF SECURITY

In discussing the issue of the environment, the 1991 *National Security Strategy* stated:

> We must manage the earth's natural resources in ways that protect the potential for growth and opportunity for present and future generations. . . .Global environmental concerns. . .respect no international boundaries. The stress from these environmental challenges is already contributing to political conflict.[19]

The 1993 NSS extends the national security dimensions of the environment and links it decisively to the economic element of power.[20] In these documents, the administration made clear that it considers environmental threats and challenges to be significant national security issues.

Academics who study national security are debating whether to include the environment as a national security issue. Some, such as Jessica Tuchman Matthews, writing convincingly in *Foreign Affairs,* suggest that today's environmental problems are so great that they threaten the future of the world and are literally threatening the security of nations.[21] Others would argue that such threats could be subsumed under previously established security issues such as economics, and some believe that areas that do not themselves relate specifically to military power or war should not be considered as national security issues.[22]

While the academic debate may go on, it is clear that both the administration and Congress consider the environment a national security issue. One of Secretary of Defense Aspin's first policy decisions was to reorganize the Department of Defense principal staff and establish the position of Deputy Under Secretary of Defense for Environmental Security. Further evidence can be found in a group of influential senators led by Senator Sam Nunn of Georgia who initiated the Strategic Environmental Research and Development Program (SERDP). This program utilizes national security assets, chiefly those of the Department of Defense, the Department of Energy, and the intelligence community, to address the

"massive environmental problems facing our nation and the world today."[23]

The SERDP recognizes that the defense community has unique resources and formally seeks to utilize these for environmental improvement. Specifically, it would divert defense technology and research and development (R&D) resources to environmental efforts, including understanding the ongoing environmental processes, cleaning up past damage, and modernizing U.S. industries to ensure a U.S. leadership position in the critical area of environmental technology.[24]

In his speech on the Senate floor, Senator Nunn clearly stated the national security threat:

> I am persuaded that there is also a new and different threat to our national security emerging—the destruction of our environment. The defense establishment has a clear stake in countering this growing threat. I believe that one of our key national security objectives must be to reverse the accelerating pace of environmental destruction around the globe.

Senator Nunn went on to stress the environmental problems' potential for conflict. Such issues as overpopulation, insufficient clean water, overgrazing, deforestation, and competition for natural resources all have the potential for creating regional conflict. Moreover, the destruction of the ozone layer by chlorofluorocarbons and halons, and the greenhouse effect caused by carbon dioxide emissions have global implications for human health. He postulates that "utilizing the defense establishment's unique capabilities for environmental improvement" is logical and one of the best methods for addressing environmental degradation's threat to national security.[25] The SERDP was funded for some $200 million and includes the following provisions.

- Using DOD and DOE nuclear weapons research supercomputers for modeling and comparing environmental data related to global warming.

- Transferring military program, advanced energy technology to the civilian sector.

• Utilizing defense resources to gather oceanographic and atmospheric data related to global warming.

• Using DOD research and development funds for environmental research programs.[26]

Senator Nunn correctly points out the major role that environmental problems play in conflict initiation, particularly in the developing world, which has population growth rates substantially greater than those of the industrialized world. These growth rates, some approaching 4 percent, can double a country's population in as few as 20 years, this threatening the legitimacy of governments and severely testing their ability to satisfy the needs of their people. It also serves as strong pressure for the government to seek solutions at the expense of its neighbors.

For many countries, environmental issues are **survival interests** and therefore potential sources of regional conflict. In the Middle East, for example, the lack of water in Iraq and Syria has the potential to further destabilize the region because Turkish water resource policies threaten the economic vitality and traditional way of life of its downstream neighbors. On the margins of the Sahara and in the Horn of Africa, refugee populations of several million have crossed borders to escape the starvation caused by overgrazing and drought. These refugees may increase the population of the host country by 10 percent or more and promote poverty. They strain the economic and social infrastructure, limit the ability of the government to satisfy systemic demands, and promote disharmony among the indigenous population when refugee organizations disproportionately address the needs of the refugees. Environment security issues are thus eroding political stability.

AN ENVIRONMENTAL FOCUS FOR SECURITY ASSISTANCE

The end of the cold war and the need to sustain the conditions necessary for peace and eradicate poverty and environmental problems are changing the focus of the Security Assistance Program for the developing world. Encouraged by

Congress, the United States is attempting to move from selling heavy military weapons and equipment to supporting nation building, environmental sustainment, and small-scale unit training, with the hope that this will help overcome such barriers to democracy as ethnicity.

Frequently, developing countries have several national groups within their political borders and thus the potential for ethnic conflict. If the government is composed disproportionately of a particular ethnic group, then other ethnic groups will frequently believe that the resources of the country are not being evenly distributed. When the country experiences economic difficulties, therefore, the government will likely be accused of unfairly reducing benefits to the regions of the country populated by the other ethnic groups, with the potential to exacerbate political instability. To the degree that the developed world can provide economic and health assistance and aid in managing the natural resources and environment of the country, it creates a more positive milieu in which these groups may seek national identity and a feeling of belonging, helps the government satisfy systemic demands, and reduces the potential for conflict.

DOD is creatively using its Security Assistance Programs in some developing countries to encourage host military forces to actively promote biodiversity, natural resource conservation, and environmental management. Quite often in the developing world, the domestic military's role in governmental policymaking is much greater than in the developed world. The military is frequently a better organized, trained and technologically-sophisticated element of the government than are other comparable organizations. Moreover, the military is generally present in all regions of the country, including the frontier, where a feeling of national identity may be absent. Because ethnicity is such an important factor in developing world politics, the military quite often will have a more regionally representative and ethnically diverse population than does the highest level of government. The military may thus promote a sense of national identity by performing environmental and economic sustainment, civic action missions.

To be sure, in the developing world the military has a mixed record as an agent of development. In the early 1960s there was a widely-held belief that because of organizational superiority the military would serve as an engine of development and facilitate improving the infrastructure of the country. This was not always proven true. Assumptions made by aid-providing organizations that the military would prefer to be involved in these sorts of activities often ran counter to the military regimes themselves which preferred to perform a strictly military function. In the cold war threat environment, the military function usually prevailed. Further, when the militaries were used as the agents of development they were often supporting Eurocentric, "northern" oriented schemes that failed to understand the limitations, cultural differences, and capabilities of the developing world. Finally, most of these efforts were attempted during the time of the cold war conflict between the Soviet Union and the United States. In this environment, both countries were primarily interested in improving their influence with the host government and the military for the purpose of denying influence to their opponent.

Today, the United States is promoting democracy and sustainable economic development. It is less inclined to overlook blatant violations of human rights for political reasons and is putting pressure on governments such as Kenya and Zaire to adopt often difficult, but, in the long term, productive democratic forms of government. When the developing world military can be encouraged to foster sustainable development, it aids in this process, promoting governmental legitimacy and political stability and serving as a useful and viable environmental resource. This fact is recognized in the new DOD environmental security mission of mitigating or deterring environmental problems that could lead to political instability.

Recognizing that poverty is the chief cause of political instability, the U.S. military has been assisting the developing countries' militaries to promote sustainable development and to maintain their natural resource base through components of the Security Assistance Program. The U.S. African Civic Action (ACA) Program, for example, provides funding, guidance and engineering review to the host government military for

nonmilitary projects designed to benefit the civilian population, often in remote areas of the country. In Ghana, the ACA program rebuilt the water supply system, providing a major hospital with a clean and purified source of water, as well as surgical equipment. In Guinea Bissau and the Ivory Coast, planes, boats, navigational aids and radar were provided so that the country could better monitor its fishery resources and reduce poaching. In Djibouti, nearly $30,000 was granted to help the military build a sanitary landfill and reduce a major health threat from open dumps. Also in Djibouti, DOD worked closely with the local military to develop a dam and irrigation scheme that prevented flooding and provided water to an area of fertile soil that has increased the much needed food supply. Thus, DOD is encouraging the developing world military organizations to perform nonmilitary missions that promote conditions for peace and help to eradicate environmental problems.

The Security Assistance Program has also focused on natural resource conservation and helping the African littoral states control the problem of international fish poaching. For decades, large fishing fleets from European and other nations have come within the economic zones and 12-mile limits of African countries and have literally raped the ocean floor, destroying the habitat while vacuuming large schools of fish from the sea. In Namibia, for example, a five month incursion of Spanish trawlers fishing for hake cost the country $100 million and resulted in long-term damage to the fisheries.[27] This poaching debilitates the habitat, threatens the carrying capacity of the fishing areas (fisheries) and impairs the livelihood of indigenous fishermen and the foreign exchange earning potential of governments. By providing the wherewithal for these countries to patrol their own economic zones (patrol boats, small observation planes, radios, and training in interdiction and international law procedures), the U.S. military has helped curtail poaching in African littoral waters, restoring the pride of the local governments and promoting regional cooperation on a critical environmental issue. This is a solution to a particularly virulent environmental problem of an international order because the endangered fish stocks

migrate up and down the coast across international boundaries.

DOD programs are also supporting the concept of biodiversity and conservation in the developing world (see Figure 1). In Fiscal Year (FY) 1991, for example, Congress made available $15 million under the Foreign Assistance Act to help the militaries of African countries protect and maintain wildlife habitats and to institute sound wildlife management, fishery, and conservation programs. The program concentrates on wildlife habitat maintenance by constructing roads in game parks, developing and building bridges and dams, and reinforcing antipoaching efforts for game parks and fisheries. It also develops a host country capacity to protect marine and terrestrial wildlife and fisheries. In Botswana, for example, $2.4 million has been allocated to train antipoaching units, and to purchase airboats for use in the famous Okavango swamp and two small airplanes for aerial surveillance.[28]

DoD Biodiversity & Conservation Projects

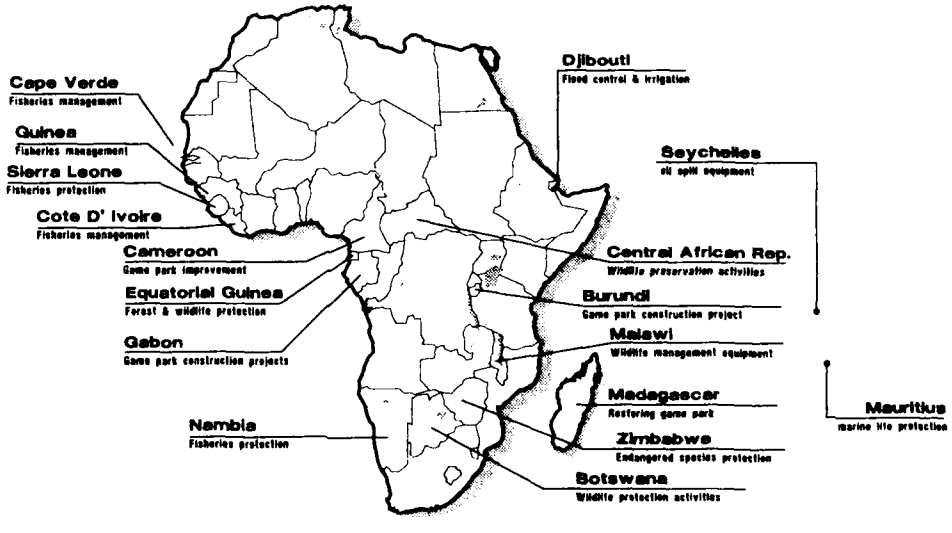


Figure 1.

Cape Verde is receiving $1.7 million to purchase a 50 foot patrol boat that will lead antipoaching efforts within its economic zone. Equatorial Guinea, Burundi, and the Central

African Republic will also receive jeeps, communications equipment and training to develop viable antipoaching units for their game parks. In Madagascar, a quarter of a million dollars is being provided for the army to restore a major game park in that politically troubled country. In Malawi, $1.5 million has been allocated to further improve its well-established wildlife management program, which has developed elephant herds large enough to require culling.[29]

Because of its success, in FY 93 Congress allocated an additional $15 million for the biodiversity and conservation program. These attempts to support biodiversity and natural resource preservation in the developing world are examples of how military-to-military contacts and DOD resources can prove useful in the effort to improve the world's environment. It also helps DOD. The Congress is increasingly critical of U.S. support to developing world militaries, fearing that such aid might promote military dictatorships. As a result, Security Assistance programs are being heavily scrutinized and zeroed out.

DOD should realign the Security Assistance Programs with the new National Security Strategy, and administration and congressional intent, stressing environmental security. Maintaining combat-arms-related security assistance programs in developing countries when Congress fears the exacerbation of the military role in government does not make sense. DOD should take advantage of congressional willingness to fund environmentally-related security assistance programs and use them to enhance the political stability and economic sustainability of governments struggling to succeed. This will contribute to regional political stability in the developing world. It will also maintain the military-to-military contacts that provide base access, overflight, staging and logistical support agreements, the strategic objectives that enable DOD to project power during conflicts in the increasingly unstable developing world.

DOD'S DOMESTIC ENVIRONMENTAL ROLE

Like it or not, DOD has a substantial domestic environmental mission that, in the current environmentally sensitive milieu, it must execute almost flawlessly, if it is to retain control of its training areas and installations as well as the support of the American people. First, as long as the government entrusts DOD with the defense mission, it will be given land on which to operate and train and will remain a major environmental manager, held accountable for the condition of its land. This can be good for the environment. Second, many of the nation's environmental problems are so large in scope or costs that they border on the unmanageable. Because of its size and resources, DOD has the capabilities to address many of these problems; increasingly, state and federal policies and enforcement agencies are insisting that this be done.

The size and power of DOD are significant. It employs approximately 3.2 million people worldwide and has an annual budget of approximately $300 billion. Its domestic land holdings are 25 million acres and it manages an additional 2 million acres of land overseas. In addition to the thousands of National Guard and Reserve Component properties, DOD has over 1,100 significant installations.[30] These installations compose the equivalent of national parks, recreation areas, vast old-stand forests and desert areas. Most have complex, city-like developments of residential, industrial and commercial areas that require municipal management practices. Unlike municipalities, these installations cannot lobby and receive exemptions for environmental noncompliance. They must comply or face fines, and the funds for environmental compliance largely come from the existing DOD budget.

The sheer size of DOD's land holdings makes it one of the largest environmental managers in the United States. This management role has increased over the years because the extensive development occurring on private land often leaves the only remaining natural habitats on DOD installations. Thus, DOD lands have become defacto game preserves for endangered species. Natural disasters and private development in the South, for example, have destroyed the

habitat of the Red-Cockaded Woodpecker and have made the old-stand timber on Forts Bragg, Polk and Benning, and Camp LeJeune particularly important to the survival of this endangered specie. While this greatly complicates training at these installations, commanders are adjusting and increasingly environmental stewardship has become a parallel mission to operational readiness. Installation commanders must now conduct realistic, combat simulation training while managing flourishing herds of game, ensuring the nesting process of endangered species is undisturbed and enhancing wetlands. The responsibility for environmental stewardship will continue.

Despite the end of the cold war and the spate of base closures, a major reduction in DOD land holdings is unlikely to occur. The United States remains a superpower, with commitments to allies, and threats to its national interests around the globe will require it to maintain a large defense force. Even at a reduced size, this force will require most of the current military installations and large tracts of land for modern, fast-moving weapons systems. Because (as the recent presidential election demonstrated) the economy is more important to the American people than most environmental issues, DOD has difficulty closing its installations. Military installations bring thousands of jobs to the local economy and millions of dollars in revenue. Often they are the single largest employer in an area. Base closures deal severe blows to the state economies and are resisted forcefully by the state's representatives in Congress. When bases are closed, it is often because of the pressure of local developers who want to build commercial enterprise on the land.

Although military land is used for training, by law it must be rotated, maintained and its wildlife habitats protected. Training areas, such as Fort Carson, Colorado, and Hohenfels, Germany, that were once abused and needlessly eroded, have been reseeded and are carefully managed with the assistance of the local civilian wildlife administrators. This is good for DOD trainers because they train in a realistic, living environment, not a dust bowl. Thus, while national security and economic reasons will prevent a major reduction in the volume of military

lands, this is not necessarily a negative environmental development. DOD lands provide a buffer against development and must now be managed for multiple uses in strict accordance with state and federal regulations and the oversight of natural resource agencies. Doing so conserves the physical environment where it may otherwise be lost.

Natural Resources.

Because DOD manages an area roughly the size of Tennessee, it has the capacity to evenly apply national natural resource laws over a substantial area of the landscape. Significantly, because of congressional demands and support, it has increasing financial, human, and organizational resources with which to maintain its environmental stewardship in multiple areas.

Forest management is a major and financially rewarding part of natural resource management within DOD. Its first forestry efforts began on Santa Rosa Island near Pensacola, Florida, in 1823 when 30,000 acres of land were set aside to be used as a renewable timber supply for ship companies. Most of DOD's forested lands were acquired during World War II, and have grown to a point where currently some 200 DOD installations manage approximately 2.3 million acres.[31] DOD follows a multi-use management program that provides outdoor recreational opportunities, wildlife habitat, commercial forestry, military training and buffer zones. This character of DOD management provides revenues for the states. The Defense Appropriations Act of 1961 allows reimbursement of expenses for forest management to be provided from the sales of timber. A later amendment to this Act in 1984 allows DOD to provide 40 percent of the revenues from forestry sales to the host state,[32] with the remaining 60 percent dedicated to natural resource management on DOD lands.

Because of its revenue producing potential, DOD has often acted to enhance forested land on acquired property. When, for example, the Air Force acquired the Avon Park bombing range in central Florida, a 106,000 acre area of the wetlands and sand hills, it spent more than $100,000 to effect natural

resource improvements and provide for multiple-use of the property. Significant improvements were made to the wetlands, which previous owners had removed for cattle grazing, and forests were replanted to provide wildlife habitat and natural resource program management revenues. Today, some 3,000 people participate annually in fishing, hunting, and other outdoor recreational activities at Avon Park.[33] Forests are a litmus test of environmental stewardship for the public and should receive special attention from DOD and installation commanders. It costs little in money or training time to execute a tree planting program, which enhances a revenue producing resource, improves eroded training areas, and gains the good will of environmental groups and the public.

Perhaps no other area of environmental concern more clearly demonstrates the value to the United States of having DOD execute national environmental standards than natural resources and endangered species protection. Because national level environmental or natural resource programs have a regional focus, they present unique coordination challenges across agency, state and municipality lines, and difficulties with financing and resource allocation. The Coastal America program announced by President Bush, for example, is designed to manage and protect coastal resources. Participants include the Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Geological Survey, Minerals Management Service, the National Oceanic and Atmospheric Administration, the National Park Service, and the U.S. Army Corps of Engineers. The program's goals include reversing habitat loss and degradation, reducing pollution from nonpoint sources and remediating contaminated sediments.[34] With such diverse goals, many state and local agencies as well as private organizations and the public must actively participate, and often individual locales find themselves unable to develop the resources necessary to perform the requirements for which they are responsible. For this reason it is important to have a strong federal presence to demonstrate that the program can work. DOD is playing such a role.

The Chesapeake Bay is one of the regions selected by Coastal America in which DOD is heavily involved. The largest estuary in the United States, the Chesapeake is threatened by the population of the Bay basin, which will double its 1950 level by the year 2020.[35] Pollution from industry, agriculture and urban areas had threatened to destroy the Bay's productive capacity and in 1975 it was singled out for rehabilitation by the Environmental Protection Agency. DOD was the first federal agency to sign an agreement with the EPA to participate in restoring the Bay.

DOD's participation is significant and demonstrates why it is such a major factor in national environmental security. Its presence ensures that some 350,000 acres of the Chesapeake Bay watershed and 65 major DOD installations will be sharing common goals and standards of performance. As a federal agency, DOD can allocate resources that most municipalities cannot. In FY 1990, for example, DOD spent approximately $50 million on erosion control, natural resource management, pollution prevention, and waste reduction in order to improve the water quality of the Bay.[36] DOD's support to the Chesapeake Bay stands in marked contrast to the environmental disaster of the Rocky Mountain Arsenal. It is an example of where DOD could enhance its stature as an environmental steward and gain good will with Congress by publicizing its success.

DOD is providing further assistance to this program through the capacity of the Corps of Engineers to share environmental expertise and assistance with local municipalities and other federal, local and state agencies that are involved in designing remediation efforts in their own areas of responsibility. The Corps of Engineers Waterways Experimentation Station developed, and is sharing with the other Coastal America program partners, the Chesapeake Bay computer model used to prioritize and manage the resolution of common Bay problems (see Figure 2).

Particularly important to the natural resource aspect of the Chesapeake Bay Initiative is the fact that the Army alone manages approximately 225,000 acres of Bay watershed, 84 percent of which is undeveloped.[37] The DOD installations are

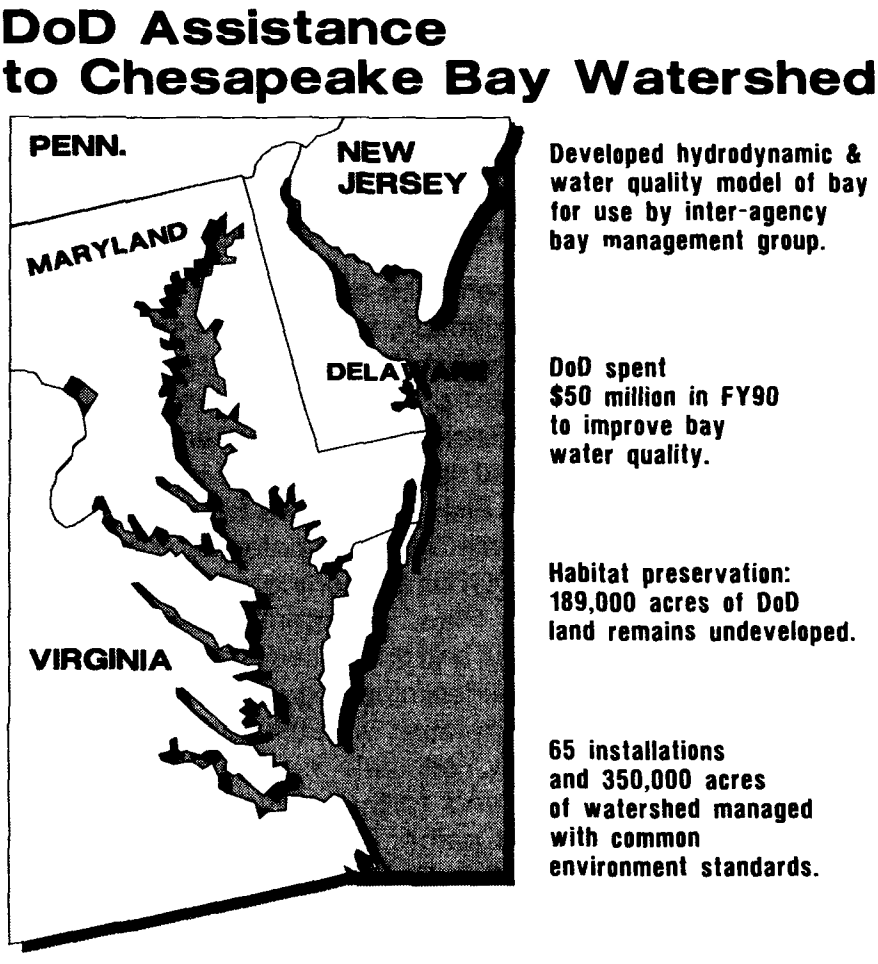


Figure 2.

thus serving as natural resource preserves where the habitat for indigenous waterfowl and other fauna and flora remain free from development pressures. What other areas can one find in populous regions (where development is both ongoing and deemed in the best interests of the local economy) where such acreage can be assured of preservation?

This is not the only program or agreement concerning natural resources into which DOD has entered. An agreement between DOD and the Nature Conservancy ensures that

biological diversity on DOD installations is documented and maintained and that endangered and threatened species are identified. Rather than being on the defensive with environmental groups, DOD is now reaching out to these sources of expertise in the quest for technical advice and assistance in developing procedures for planning and conducting natural resource improvement programs.[38]

Wildlife habitat management is another area where DOD is making a significant contribution. Since 1960, DOD has been authorized under the Sikes Act (16 U.S. Code 670) to execute fish and wildlife conservation programs on military reservations in coordination with the Secretary of Interior and the various states. DOD has expanded upon its programs under the Sikes Act to work with the U.S. Fish and Wildlife Service identifying areas on its installations with "excellent potential" for waterfowl habitat. This means that DOD is supporting the North American Waterfowl Management Plan, an international agreement jointly executed by Canada and the United States, the purpose of which is to "reverse the declining population of waterfowl in North America."[39] In cooperation with this plan, installations, such as Fort Drum in New York state, have initiated extensive programs to maintain and further develop wetlands on migrating waterfowl flight paths. DOD is turning to qualified agencies, in this case the Fish and Wildlife Service, for assistance to better manage its vast land resources and natural resource programs.

The program with the greatest potential to enhance natural resources is the Legacy Resource Management Program. The Legacy Program resulted from a 1991 congressional bill that provided the funding to elevate DOD stewardship of natural and cultural resources. The purpose of the program is to "promote, manage, research, conserve and restore the priceless biological, geophysical and historical resources which exist on public lands, facilities, or property held by DOD."[40] However, DOD is not executing the Legacy Program alone. In the first 8 months of 1991, 48 governmental and nongovernmental partners supported Legacy Programs on 80 different installations in more than 100 separate Legacy activities, such as the inventory, protection and management

of biological resources. Projects have already begun in some 31 states and approximately 10 other projects are multistate in nature; and, DOD has requested $10 million for the Legacy program in FY 1994.[41] While DOD provides assets such as scientists, managers, engineers, military personnel and contractors, the other partners, which include such organizations as the Tribal Elders Council of the Santa Ynez Chumash Indian Reservation, the Nature Conservancy, the Arizona Fish and Game Department and the University of California, Los Angeles, provide local vision. Projects have included restoring 2,000 acres of wetland and hardwood forest at Barksdale Air Force Base in Louisiana, and 21 of the projects dealing with natural resources were specifically connected to protecting endangered and threatened species. The Legacy Program is another example of Congress using DOD as an agent of environmental security.[42]

DOD installations contain more than 250 endangered or threatened species which must be managed under the intense scrutiny of local environmental groups. Often this occurs because the surrounding habitat has been destroyed through development, urban sprawl, or population growth, which are common trends throughout much of the United States.

A good example of how DOD stands as an agent against development and maintains America's natural resources is the Camp Pendleton Marine Corps installation, located between San Diego and Los Angeles. The metropolitan areas of both of these cities have sprawled uncontrolled the length of the coast with the exception of the 125,000 acres of the Camp Pendleton reservation. Although a major training center for Marine combat units and a full, multi-use military installation that includes bombing practice, artillery, helicopter, tank and amphibious force operations, Camp Pendleton serves as an oasis of what was, before urban development, some of the most beautiful coastline in America. It remains a sanctuary for several endangered and rare species. Camp Pendleton has the highest density of nesting sites on the North American continent for the Least Bells Virio and California Least Tern. Pendleton also has a sizeable deer population and serves as a major southern California waterfowl wintering area.[43] There

is competition between training and natural resource preservation and the tradeoffs do constrain training. However, operational readiness for the Marine units at Pendleton is being maintained. Environmental stewardship is the price that Congress is demanding for the military's use of American land and DOD has no choice but to pay.

In FY 91, DOD supported the Legacy Program and its cooperative agreements with nonmilitary partners with personnel, land, other resources, and backed this with investments totalling $7.5 million. DOD has requested $10 million for Legacy in FY 1994, to be used for the "conservation and management of federally listed threatened and endangered species."[44] DOD natural resource preservation programs capitalize on the Department's control of and ability to manage rare segments of undeveloped or multi-use landscape, and the extensive technological capabilities and the financial resources that it can dedicate to the environmental cause.

Environmental Restoration.

Like many large corporations with extensive industrial activities, DOD historically dealt with its toxic and hazardous waste in a cost-minimization fashion. When environmental concerns in the United States began to focus on the health and environmental effects of toxic and hazardous waste products, DOD, like other corporations, found that it had substantial areas that required remediation. However, unlike many corporations, which sold their property or went bankrupt when they found that they could not afford to effect cleanup, DOD has begun the monumental task.

In the early 1960s the world's attention was drawn to the problems associated with hazardous waste as a result of works such as Rachel Carson's *Silent Spring*. Until that time, most corporations and governments, state and local, disposed of their hazardous waste products as cheaply as possible in a cost-minimization fashion. DOD was no different. Because it had the responsibility for managing the military industrial complex (including weapons manufacture and maintenance,

ammunition facilities, and test and laboratory facilities), DOD has substantial areas where toxic and hazardous waste was disposed of in what is today considered an unacceptable manner.

DOD's formal efforts to come to grips with its toxic and hazardous waste problem were initiated in 1984 with the Defense Appropriations Act. Under this Act, a program known as the Defense Environmental Restoration Program (DERP) was established and funded through a new transfer account known as the Defense Environmental Restoration Account (DERA). The DERP has two major programs: the Installation Restoration Program (IRP) and the Other Hazardous Waste Operations Program (OHW). Under the IRP, contamination at DOD installations and formerly-used defense properties are investigated and, when necessary, the cleanup process is begun. Under the OHW program, research and development and demonstration programs are initiated that reduce the rates at which DOD hazardous waste is generated.[45]

The continuing authority for the Secretary of Defense to execute this program is contained in the Superfund Amendments and Reauthorization Act of 1986 (SARA). This also requires that DOD execute its program with the advice and consultation of the EPA. Further clarification of the Secretary of Defense's responsibilities for executing the DERP are contained in the 1987 Executive Order 12580 on Superfund implementation, which clarifies DOD responsibilities under SARA and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Funding is provided by the Defense Appropriations Act.[46]

The funding that DOD has allocated to the DERA program has increased constantly since 1984 and reflects both the resources required by DOD to effect this cleanup and its commitment. In 1984, the first year of the DERA program, $150 million was allocated for environmental restoration. That figure doubled in 1985 to $314 million and by 1990 the annual expenditure on the DERA account was $601 million. However, over that period more extensive auditing of DOD installations began to occur and funding increased with new discoveries. In FY 1991 DOD spent over $1 billion cleaning up contaminated

sites. In FY 92 the expenditure was approximately $1.3 billion, for FY 93 the figure jumped to $1.6 billion, and for FY 94, DOD has requested $2.3 billion (see Figure 3).[47] Although future estimates may vary because of changes in technology, the discovery of new sites, or modification in current cleanup costs, most experts believe DOD's cleanup expenses will continue to rise dramatically. Cleanup costs were projected to peak in 1998 when annual funding for DOD's environmental restoration program would reach $2.8 billion; however, this estimate now seems conservative.[48]

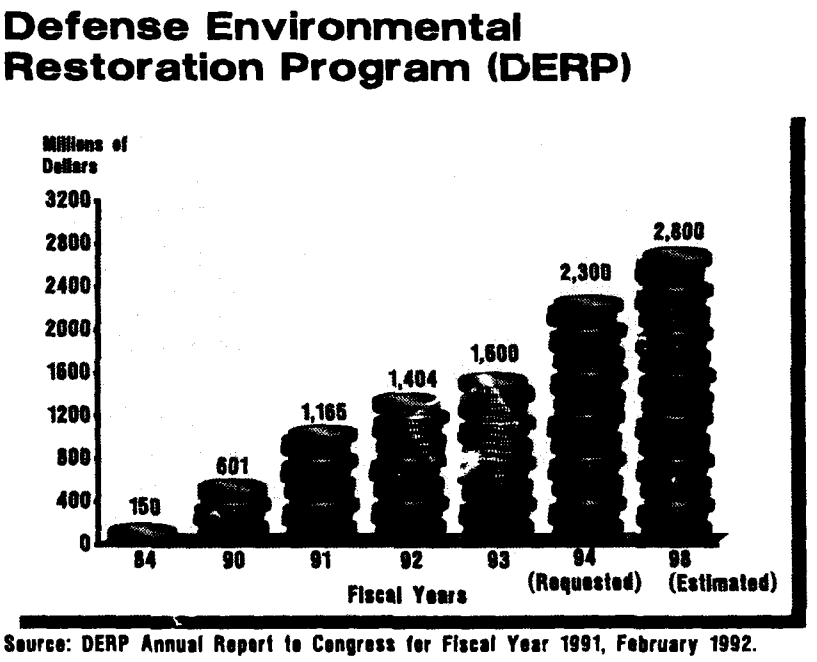


Figure 3.

The costs of environmental cleanup are rising. In 1991 the Department of Energy (DOE) revised upward its own estimates for the cost of cleaning up its toxic and hazardous waste by 50 percent. DOD, with approximately 17,600 potential hazardous waste sites, will **certainly** increase the estimate of its total cost from the 1992 estimate of $24.5 billion when all of these sites are fully evaluated and the cost of developing technology for the most difficult is fully realized.[49] Regardless of the costs, DOD is currently committed to funding the cleanup of all its

hazardous waste sites. This is not a sound policy. DOD should cap the percent of its budget that is dedicated to the remediation of toxic and hazardous waste sites. The current policy of funding cleanup from DOD coffers discourages the discovery of new toxic and hazardous waste sites and will quickly lead to a disproportionate share of the Defense budget being spent on cleanup. This practice will erode combat readiness and threaten funding for such important defense measures as new weapons development. DOD must insist that Congress provide a separate funding source that is not included in the DOD budget (a Defense Super Fund) to pay for those toxic and hazardous waste sites that are beyond this percentage cap.

In addition to the Installation Restoration Program, which focuses on cleaning up toxic and hazardous waste, the Other Hazardous Waste Program (OHW) examines current operations and attempts to find cost-effective approaches to waste management and to prevent pollution at its source. The demonstrations of pollution prevention and hazardous waste management technology are developed under the Army's Total Quality Management program of hazardous waste initiatives, research and development.

DOD is dedicating substantial research and development resources to fund cleanup technologies for hazardous waste. Two groups that have worked on this effort are the Installation Restoration Technology Coordinating Group, with representatives from each service, and the Joint DOD/EPA/DOE Working Group, established in 1985 to examine the cost of hazardous waste cleanup and determine what technology was needed for all three organizations. Because of these R&D efforts and the sharing of the technology developed, major changes have been made which affect not only DOD and DOE, but also other national Superfund sites administered by the EPA.[50] This new technology directly contributes to U.S. environmental security.

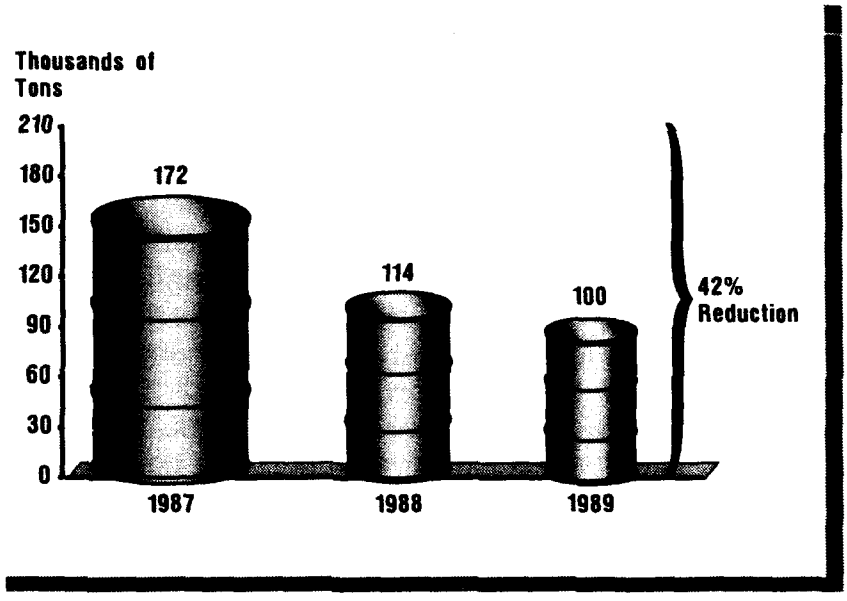
While DOD once hid behind the construct of Sovereign Immunity when dealing with state and local enforcement agencies, it has now developed a model, the Defense and State Memorandum of Agreement, that facilitates the open and

active participation of states in cleaning up DOD installations.[51] DOD has approached all states and asked that they participate in this memorandum of agreement program. Thus far, more than 40 states and/or territories have favorably responded. Under this program, DOD pays the states to participate and monitor the cleanup processes at DOD installations. In FY 1991 alone, approximately $16 million was given to state regulatory agencies to facilitate their assistance in evaluating and providing oversight for installation restoration program actions.[52] In addition, DOD is spending substantial amounts of money to clean up its formerly used defense sites. In FY 1991, $88.9 million was invested in the IRP for these sites.[53]

Pollution Prevention.

The wisest use for environmental funding is to prevent pollution in the first place. In FY 1991, DOD invested $56.4 million of DERP monies in hazardous waste minimization projects.[54] The goal of DOD has been to reduce hazardous waste production by 50 percent between 1987 and 1992. Funding of this magnitude made this reduction possible (see Figure 4). By 1989 DOD had reduced the total hazardous waste off-site disposals by 42 percent and stayed ahead of target to reach its 50 percent reduction goal by December 1992.[55] As a result of the emphasis that DOD has put on hazardous waste minimization programs, there have been a number of successes that demonstrate why these programs make sense. One example is the Marine Corps Air Station in Yuma, AZ, where the aircraft intermediate maintenance department reduced its generation of liquid hazardous waste by 90 percent, some 108,000 gallons. The estimated cost savings in hazardous waste disposal at Yuma are $270 thousand per year.[56] DOD's ongoing hazardous waste minimization R&D programs have developed such promising and demonstrated technologies as using ion vapor deposition of aluminum instead of cadmium plating at depot facilities; the use of electrode dialysis to further the life of spent chromic acid solutions, thereby minimizing the waste generated from chromic acid baths; and recycling blasting grit contaminated with lead, copper, or tributyl tin into aggregate asphalt with

Reduction in DoD Hazardous Waste Disposal



Source: Defense Hazardous Waste Management Program - A Status Report, December 1990.

Figure 4.

saving disposal costs of $200-500 a ton, with annual savings of approximately $4.5 million.[57]

One of the most important changes in the way DOD does business came with the 1989 *DOD Directive 4210.15, Hazardous Material Pollution Prevention*, in which DOD policy was changed to include the focus of hazardous material management on "the lowest entire life-cycle costs in terms of human health and the environment."[58] This moves DOD away from the "end-of-pipe" management of hazardous waste and tells program managers to examine the life-cycle costs of equipment and weapons systems that include the cost of "acquiring, handling, using and disposing of any hazardous or potentially hazardous materials."[59] While the military services' acquisition programs were operating under the vague National

Environmental Policy Act (NEPA), the weak guidance did not consider hazardous materials as a cost factor in weapons systems acquisition. The DOD directives were revised to encourage incorporating environmental impact planning into the very earliest phases of weapons system procurement and will save DOD billions of dollars in hazardous waste cleanup costs.

Compliance.

Compliance refers to ensuring that daily DOD operations and training are conducted in strict compliance with environmental requirements and laws. One of the most difficult tasks for DOD is to ensure that each of its many thousand installations obey the laws and regulations of the Federal Government, state and local governments, and when necessary, the Host Nation government. The governmental regulations that are promulgated by each have increased exponentially and change frequently (see Figure 5). It is very difficult for DOD to monitor each of these changes, determine how they apply to the operations and training activities of the specific installation, and ensure that installation is able to modify its behavior to achieve compliance. Many compliance concerns, if not properly addressed, will become expensive remediation problems. For example, such areas as air quality management, noise pollution, solid and hazardous waste management, historic site management, endangered species, and waste water discharge are but a few of the complicated issues that DOD installation commanders must face daily.

The resources that DOD has dedicated to the compliance effort have risen substantially over the years. The Army, for example, has increased its compliance funding from a 1990 figure of $314 million to a FY 93 estimated budget of $555 million.[60] DOD has increased compliance funding even more dramatically. In FY 91 DOD spent in excess of $800 million to conform to federal, state and local environmental regulations and laws. In FY 92 it increased its compliance funding by more than 60 percent to some $1.3 billion and in FY 93 the figure rose to $2.5 billion.[61]

Federal Environmental Legislative Growth

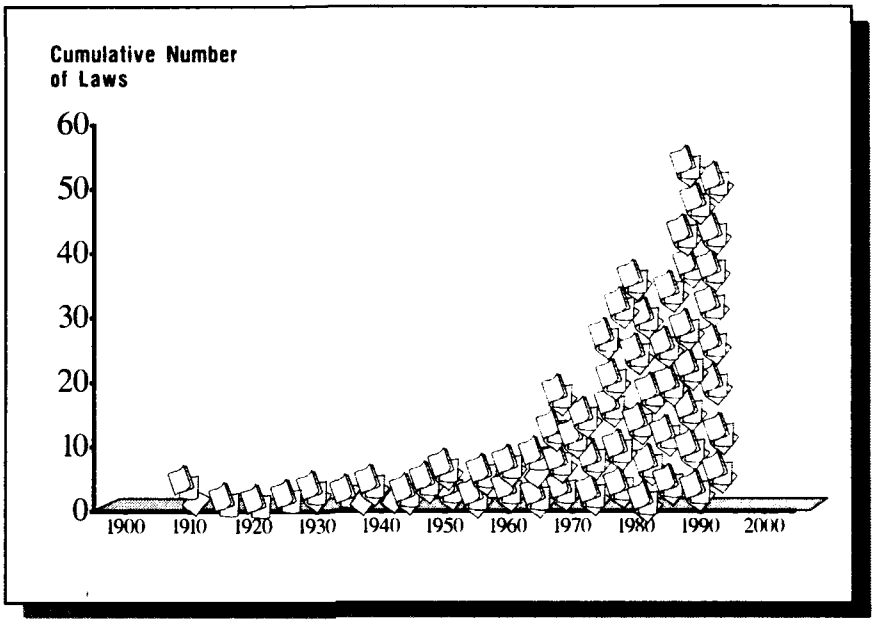


Figure 5.

While funding demonstrates the commitment of financial resources, DOD has developed systems and programs to ensure that these monies are officially utilized. For example, the Army has established the Environmental Compliance Assessment System (ECAS) with which military installations manage their compliance levels and requirements. Another Army program is the Computer-Aided Environmental Legislative Data System (CELDS) which provides regulatory summaries of state and federal environmental regulations. The Army is implementing this program in conjunction with EPA and DOE. To meet Office of Management and Budget Circular A-106 requirements, the Army developed an automated reporting system that tracks the $2 billion that it spends annually on its environmental program. Finally, as outlined in Section 404 of the Clean Water Act, the Army is responsible for regulating activities that impact the nation's water resources and wetlands.[62] If a private group, individual, or public agency

has a proposed water-related activity, such as dredging, they must obtain a permit from the U.S. Army. The permitting process requires that actions are taken to protect the environment while the activity is underway. In FY 91 alone, the Army reviewed and authorized more than 90,000 activities relating to the waters of the United States.[63]

A primary benefit of having DOD actively involved in environmental work is that it brings national level resources to bear on state and local environmental problems. DOD offers a breadth of experience and the ability to transfer solutions that have been found to apply in some regions, to other parts of the United States and offer them as possible solutions to local environmental managers. Installation environmental coordinators are local environmentalists who have been trained and educated in the laws of their states and local municipalities. These experts are intimately familiar with the requirements that must be met in their regions, and they may draw upon increasing financial resources, as well as access to national level R&D and technology to solve these problems. DOD, then, brings a combination of local expertise and management and high-powered national level financial and technical resources to the environmental arena. It is spending approximately $2-3 billion per year on environmental improvement (which will occur throughout the 1990s) and this money is being administered through sophisticated automated data processing systems, applied to total quality management environmental programs, and ultimately serving the requirements of locally trained and aware environmental managers.

No other organizations or associations of organizations have the regional presence, management expertise, or resources to execute these environmental missions with the success of DOD. Using DOD resources for local or regional environmental improvement is a nascent phenomenon. As more and more associations of state and local governments turn to DOD for help, DOD's role and contributions will expand. The Chesapeake Bay program and events occurring at Camp Pendleton, California, are but two examples of how DOD can

be utilized to satisfy the objectives of U.S. environmental security interests.

THE ARMY CORPS OF ENGINEERS

A primary U.S. environmental security asset is the Army Corps of Engineers. Previously condemned by environmentalists for its role in congressional, water resource "pork barrel" schemes, the Corps is now receiving high praise from environmental organizations for its creative environmental programs, international activities, and efforts to remediate some of America's most problematic toxic and hazardous waste sites.

The Corps of Engineers has environmental responsibilities both within and outside of the Army. Within the Army, the Corps is responsible for most installation construction, real estate transactions, and environmental management. The Corps also manages a separate major command that performs services for the Army and other DOD and federal agencies on a reimbursable basis. Within this command is the 40,000 person Civil Works organization. In addition to its water resource management projects, the Civil Works Branch is now heavily involved in remediating the nation's toxic and hazardous waste sites. At locations such as Hanford, Washington, and the Rocky Mountain Arsenal, the Corps' Civil Works arm is already serving as the design and remediation management supervisor and is rapidly becoming the nation's primary toxic and hazardous waste cleanup manager. In FY 89, for example, the Environmental Protection Agency was the Corps' largest individual customer, with the Corps accounting for 40 percent of the dollar volume of the Superfund Program's remediation work.[64]

The Corps is uniquely suited to perform this task. Its Civil Works force is distributed across all regions of the United States and organized into 10 divisions and 36 districts. The districts have fully integrated staffs, with multiple capabilities, who are familiar with the often unique state and local environmental regulations and the nuances of local government. With such a geographically broad organization,

the Corps can ensure that common methods and standards of remediation are maintained in all parts of the country and that promising new cleanup technologies that prove viable are applied to all regions.

The importance of having a single national organization capable of managing the cleanup of health threatening toxic waste from such diverse sources as nuclear weapons, chemical and nerve agents, and carcinogenic industrial compounds is made clear by the costs involved. U.S. taxpayers will pay for this cleanup; and with individual sites, such as Washington State's Hanford Reservation, totalling as much as $50 billion, it must be efficiently and safely managed. The fact that EPA's total spending for the 1993 budget is *only* $7 billion puts this figure in alarming perspective. With hundreds of federal facilities yet to be fully evaluated, reasonable estimates of Department of Energy and DOD cleanup costs are as high as $400 billion.[65] This is much more than the highly publicized peace dividend, and having a nationally integrated organization capable of efficiently and consistently executing the cleanup contracts is a major contribution to environmental security.

The Corps' environmental contribution goes beyond toxic and hazardous waste cleanup. Its responsibilities include maintaining the nation's waterways, rivers and harbors, dams, locks, and many recreation areas, as well as managing and being environmental steward for 12 million acres of land. The Corps' management of this land is often cited for positive contributions to habitat development and species reintroduction. Finally, the Corps research laboratories, such as the Waterways Experimentation Station (WES) and the Construction Engineering Research Laboratory (CERL) have been leaders in environmental systems management. At WES, the Corps developed the highly praised, comprehensive water flow model of the Chesapeake Bay that enables the multiple federal, state, municipal water resource agencies to systematically prioritize problems and manage this complex ecosystem.[66] CERL pioneered the use of geographic information systems in environmental land management that enables installation commanders to balance training and

complex natural resource requirements. Their Integrated Training Area Management Program (ITAM) allows federal facilities to practice multiple-use programs while monitoring such environmental variables as erosion, wetlands, habitat and endangered species. Although not well publicized, the Army Corps of Engineers is playing an integral role in U.S. environmental management.

CONCLUSION

Local and state government, the administration and Congress increasingly view DOD as a positive agent of environmental security. DOD is perhaps the best resourced of all federal agencies performing an environmental mission. The military is well organized and can bring its organizational abilities to bear on local environmental problems. It is present in every state, in all regions, and it has substantial financial, human, research and development, and technological resources with which to contribute to the nation's environmental security. Moreover, properly managed, DOD environmental R&D efforts will create products that could be marketed overseas by U.S. corporations, improving international security while enabling U.S. firms to expand their market share in the lucrative environmental market. DOD has established environmental cooperation agreements with conservation groups and has made significant contributions to federal, state, and local environmental programs. In addition, DOD's international programs are encouraging the armed forces of developing countries in nontraditional roles that include biodiversity and environmental improvement, health care, and sustainable economic development. DOD has substantial potential for further positive contributions to environmental security without compromising combat readiness. With the appointment of the Assistant Secretary of Defense for Economic and Environmental Security, a more substantial DOD role in the accomplishment of the NSS environmental objectives should be expected.

RECOMMENDATIONS

• Guard against overkill—some will want to divert DOD funds to environmental security issues to a degree that would sacrifice combat readiness. While new environmental roles and missions are warranted, a balance must be maintained. In former days, operational readiness was treated as an exclusive objective and environmental matters were often ignored. Secretary Aspin's appointments and the creation of an Assistant Secretary for Environmental Security introduce new leaders who will pursue additional roles for the military in which the balance between combat readiness and environmental issues could be lost. Combat readiness must remain DOD's primary focus.

• Use the environment for DOD's advantage. DOD has avoided associating itself with its environmental good deeds for fear that publicizing them would raise expectations and DOD would be forced by public opinion to do more. This is a negative and counterproductive approach. Virtually every large-scale manufacturer in the United States is attempting to associate its name with environmental good deeds because it is a good marketing strategy and takes advantage of a popular public opinion. DOD should publicize its substantial environmental contributions, and use them to create the goodwill with Congress and the public necessary to accomplish other DOD objectives such as base expansion or even recruiting.

• In recognition of this clear direction of the Congress, expand the environmental dimensions of DOD's Security Assistance Programs in all regions, not just Africa. Congress has made it clear that it is reluctant to fund Security Assistance Programs for the developing world, programs that are essential for maintaining base access and overflight agreements, and communication with military governments and leaders. At the same time, the Congress has demonstrated that it is willing to fund security assistance programs dedicated to environmental issues by earmarking $30 million for African conservation and biodiversity Security Assistance Programs. This would allow DOD to capitalize on a popular and important issue in the

"North-South" debate. It would also maintain military-to-military contacts useful for strategic security reasons, when they might otherwise be lost, and support the humanitarian, democratic and environmental objectives prominently featured in the current *National Security Strategy*.

- Establish a percent of its budget that DOD is willing to spend for environmental cleanup and demand that Congress provide separate, non-DOD budget appropriations for any additional environmental cleanup to be undertaken in a given year. If this is not done and congressional estimates of DOD cleanup costs of $400 billion prove accurate, then operational readiness cannot be properly funded. DOD funding for toxic and hazardous waste cleanup is a bottomless pit that must be avoided before it grows to a level that threatens combat readiness. DOD estimates that it will spend $2.8 billion a year cleaning past environmental sins by 1998. This estimate is conservative because most DOD bases have not been properly audited for toxic and hazardous waste problems. DOD should follow the lead of new EPA chief Carol Browner and differentiate between those problems that are health related and those that are not, concentrate its funding on health-related problems, and put other cleanup sites into a category of those to be funded when the Congress makes additional monies available.

- Involve the U.S. Army Corps of Engineers more extensively in the solution of international environmental problems. The Corps has substantial and well-respected environmental assets, which are frequently promoted by the Congress. Their involvement will provide military-to-military contact and the opportunity to promote the sale of U.S. environmental technology that will improve the balance of payments deficit. Moreover, the lessons learned from solving international environmental problems provides knowledge that can be transferred to the solution of problems in the United States and helps new democratic governments cope with overwhelming environmental problems that threaten their legitimacy.

- DOD environmental funding should emphasize pollution prevention and day-to-day compliance over the cleanup of

toxic and hazardous waste resulting from past practices. This will demonstrate to critics that DOD will no longer violate environmental laws and save the Department substantial funds in fines and penalties under the new Federal Facilities Compliance Act and in future cleanup costs.

- DOD should seek congressional funding for environmental research and development so that it can determine more cost effective ways of cleaning up toxic and hazardous wastes unique to its operations, and develop a vision for how this technology can be sold domestically and internationally to recoup its investment and reduce the overall costs for remediation.

- DOD must have an environmental strategy and vision of how it can utilize its resources to accomplish environmental security objectives, which the Congress, the administration and the American public commonly believe are important, while maintaining its military capabilities. The environment is an **opportunity** for DOD to make substantial gains in numerous traditional areas of interest. Environmental stewardship and combat readiness need not be mutually exclusive. By embracing such a vision DOD can maintain its overseas base access and military-to-military contacts, promote regional stability, create a more favorable environment in which to pursue other important domestic objectives, and minimize the criticism and interference of environmental groups in training and operational matters.

ENDNOTES

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